



Western Washington University
Western CEDAR

Salish Sea Ecosystem Conference

2014 Salish Sea Ecosystem Conference
(Seattle, Wash.)

May 1st, 8:30 AM - 10:00 AM

Understanding Microplastic Marine Pollution with Citizen Science Partnerships

Julie Masura

University of Washington Tacoma. Puget Sound Institute, jmasura@uw.edu

Joel Baker

University of Washington Tacoma. Puget Sound Institute

Susie Richards

Service Education Adventures

Chris Burt

Service Education Adventures

Megan Addison

Sound Experience

Follow this and additional works at: <https://cedar.wwu.edu/ssec>



Part of the [Terrestrial and Aquatic Ecology Commons](#)

Masura, Julie; Baker, Joel; Richards, Susie; Burt, Chris; and Addison, Megan, "Understanding Microplastic Marine Pollution with Citizen Science Partnerships" (2014). *Salish Sea Ecosystem Conference*. 108.
<https://cedar.wwu.edu/ssec/2014ssec/Day2/108>

This Event is brought to you for free and open access by the Conferences and Events at Western CEDAR. It has been accepted for inclusion in Salish Sea Ecosystem Conference by an authorized administrator of Western CEDAR. For more information, please contact westerncedar@wwu.edu.

UNDERSTANDING MICROPLASTIC MARINE POLLUTION WITH CITIZEN SCIENCE PARTNERSHIPS

**Julie E. Masura¹, Joel Baker¹, Susie
Richards², Chris Burt², and Megan Addison³**

**University of Washington Tacoma¹
Service Education Adventure²
Sound Experience³**



Outline

- Describe research project
- Review sampling and field methods
- Introduce partners
- Review contributions
- Discuss benefits and challenges

Outline

- **Describe research project**
- Review sampling and field methods
- Introduce partners
- Review contributions
- Discuss benefits and challenges

Our Task

- To quantify certain types of microplastics in specific locations in the ocean.

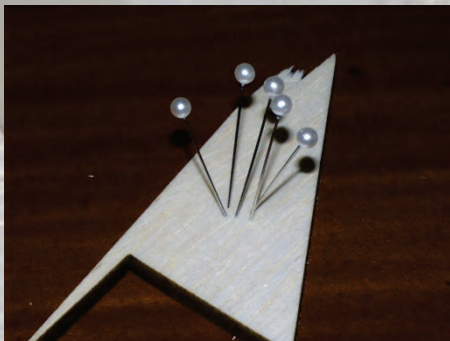
Plastics

- Any solid material comprised primarily of polymers
- Primary plastics
manufactured for use
- Secondary plastics
degradation of primary plastics



Size Classifications

Classification	Size
Megaplastics	> 100 mm
Macroplastics	5 - 100 mm
Microplastics	0.330 - 5 mm (330 μ m - 5 mm)
Nanoplastics	< 0.330 mm (< 330 μ m)

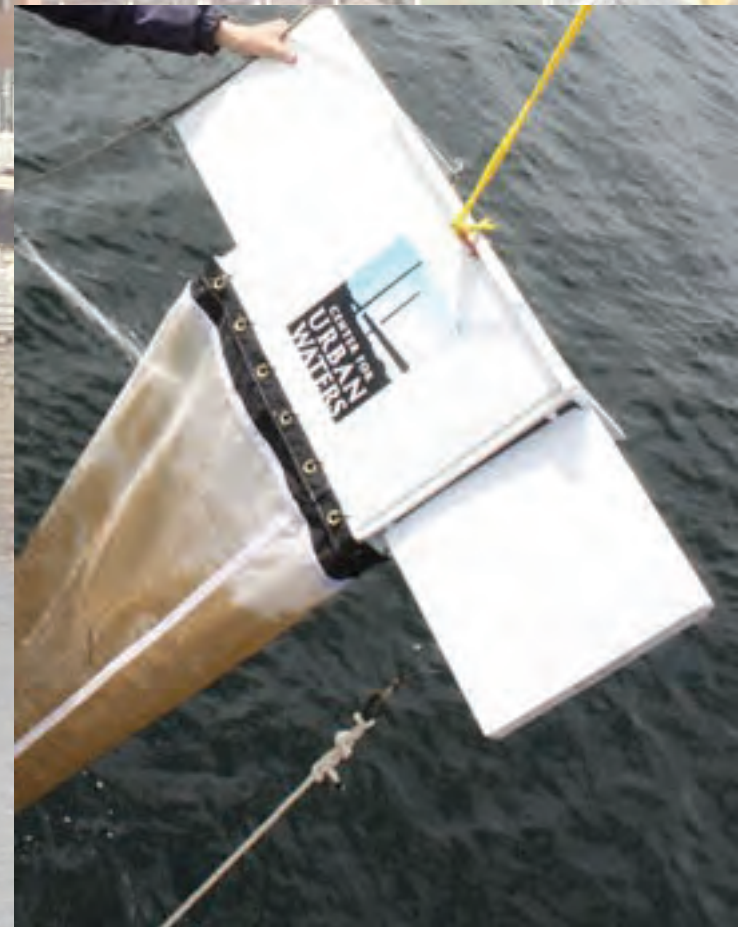


Outline

- Describe research project
- **Review sampling and field methods**
- Introduce partners
- Review contributions
- Discuss benefits and challenges

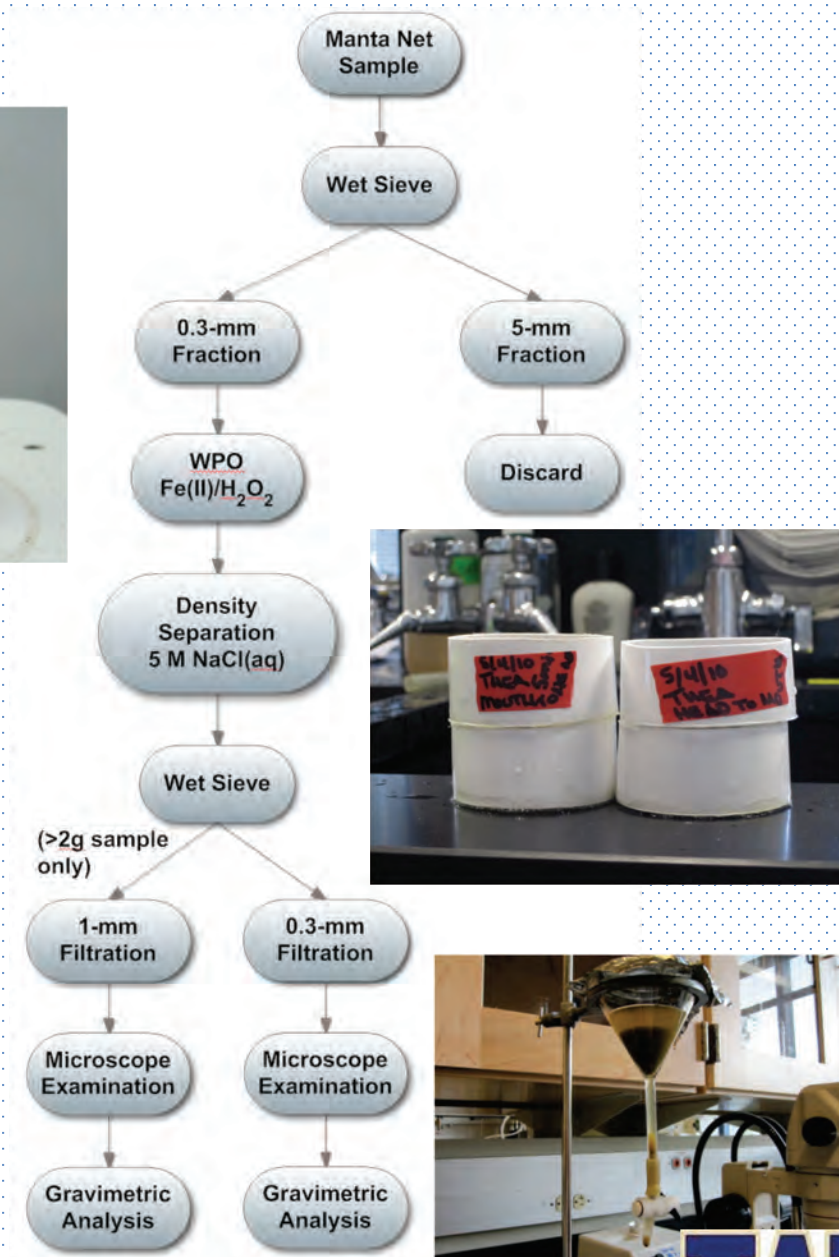
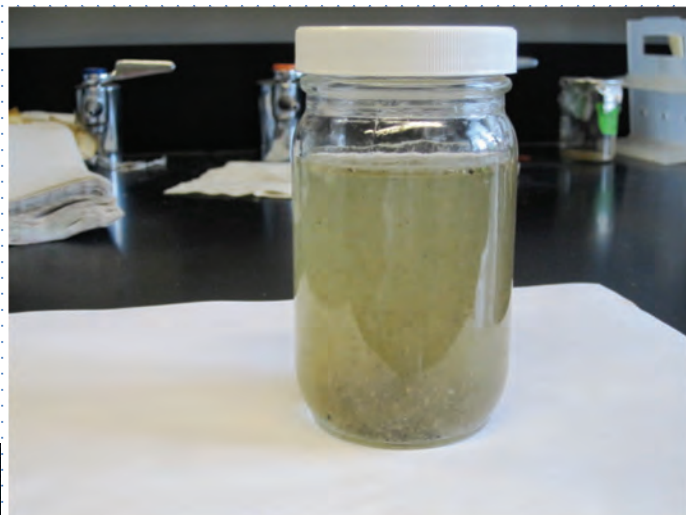
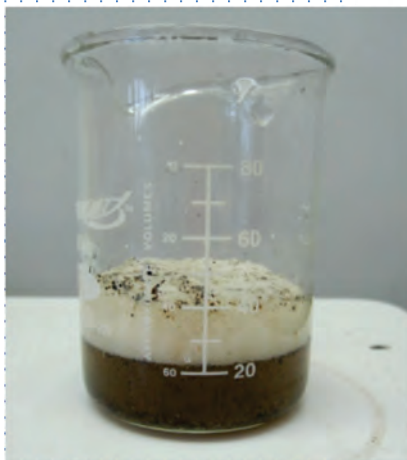
Field Methods

- Solid materials from upper 0.2 m
- Custom-fabricated manta net
- Towed at 0.7-4.5 m/s for 5-15 minutes
- Field sieved between .3 and 5 mm
- Transported on ice



Analysis of Microplastics in Water

- Wet Sieve
- WPO
- Density Separation
- Wet Sieve
- Microscope Evaluation
- Gravimetric Analysis



Outline

- Describe research project
- Review sampling and field methods
- **Introduce partners**
- Review contributions
- Discuss benefits and challenges

Current and Future Work



www.urbanwaters.org





- Mission: Promotes engagement with community and spirited environmental stewardship by connecting youth and adults in real-world learning and meaningful service in the Puget Sound region.



Sound Experience

educate
inspire
empower



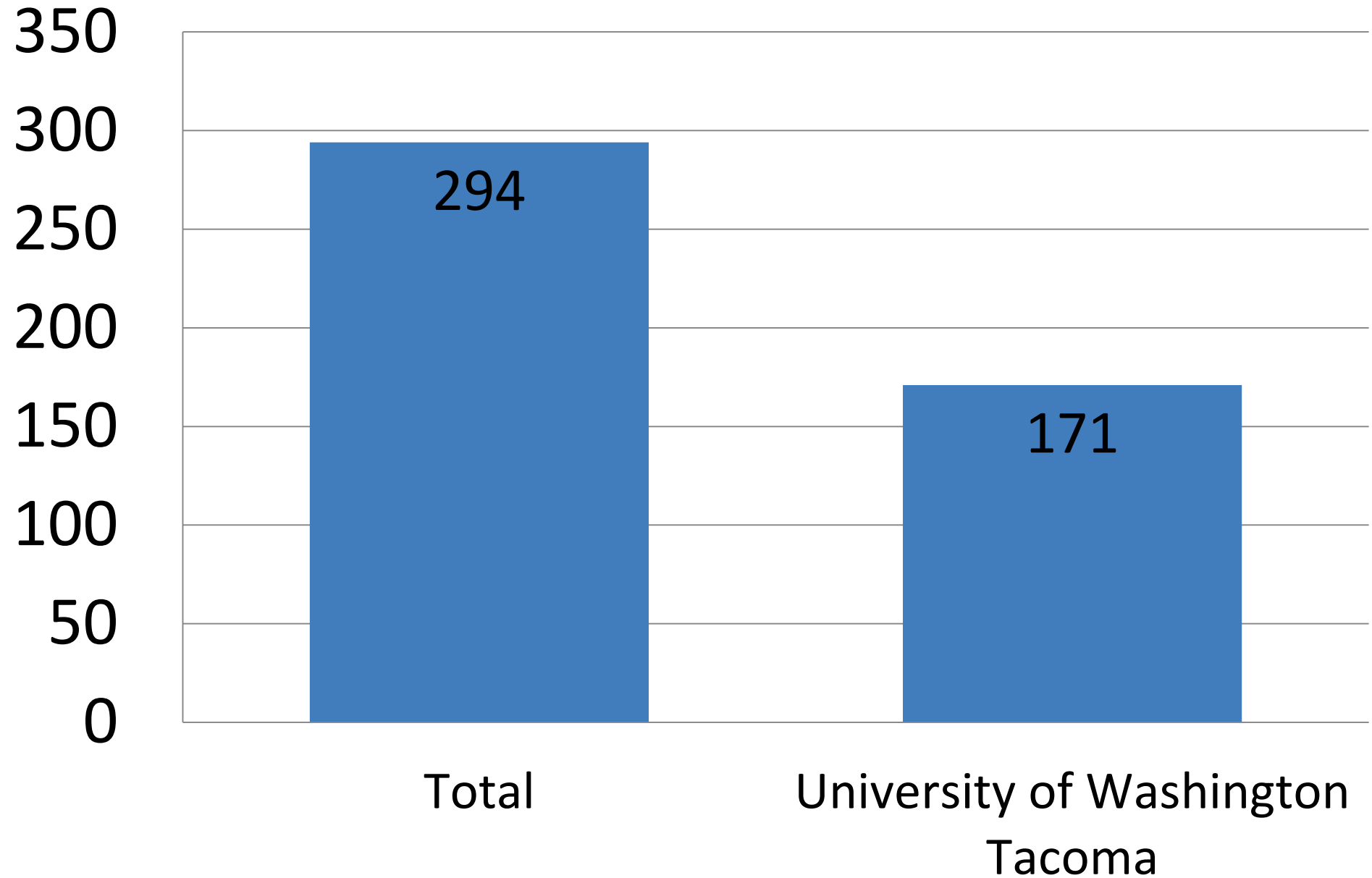
- Mission: Sails the historic schooner *Adventuress* to educate, inspire, and empower an inclusive community to make a difference for the future of our marine environment.

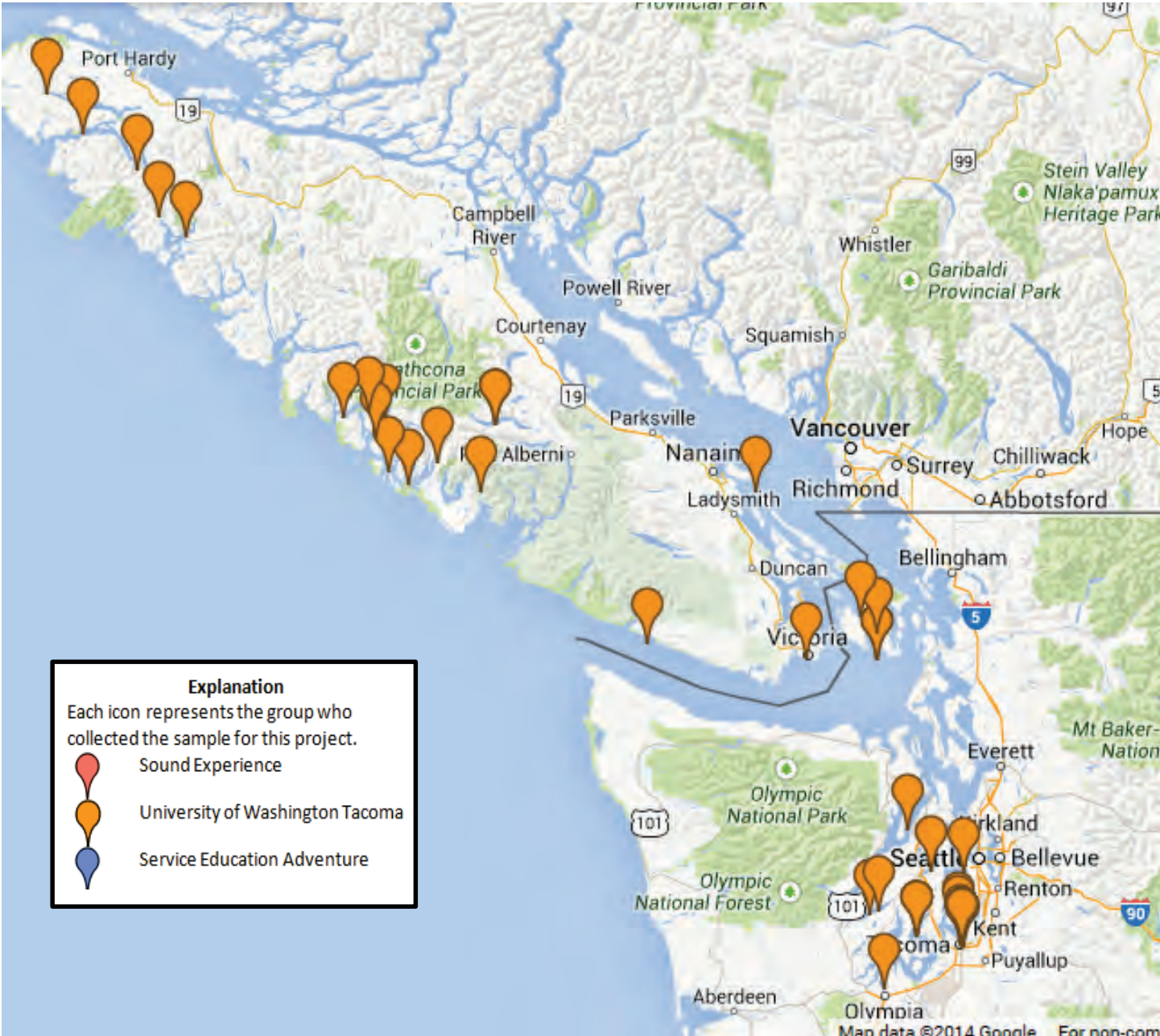


Outline

- Describe research project
- Review sampling and field methods
- Introduce partners
- **Review contributions**
- Discuss benefits and challenges

Number of Samples Collected

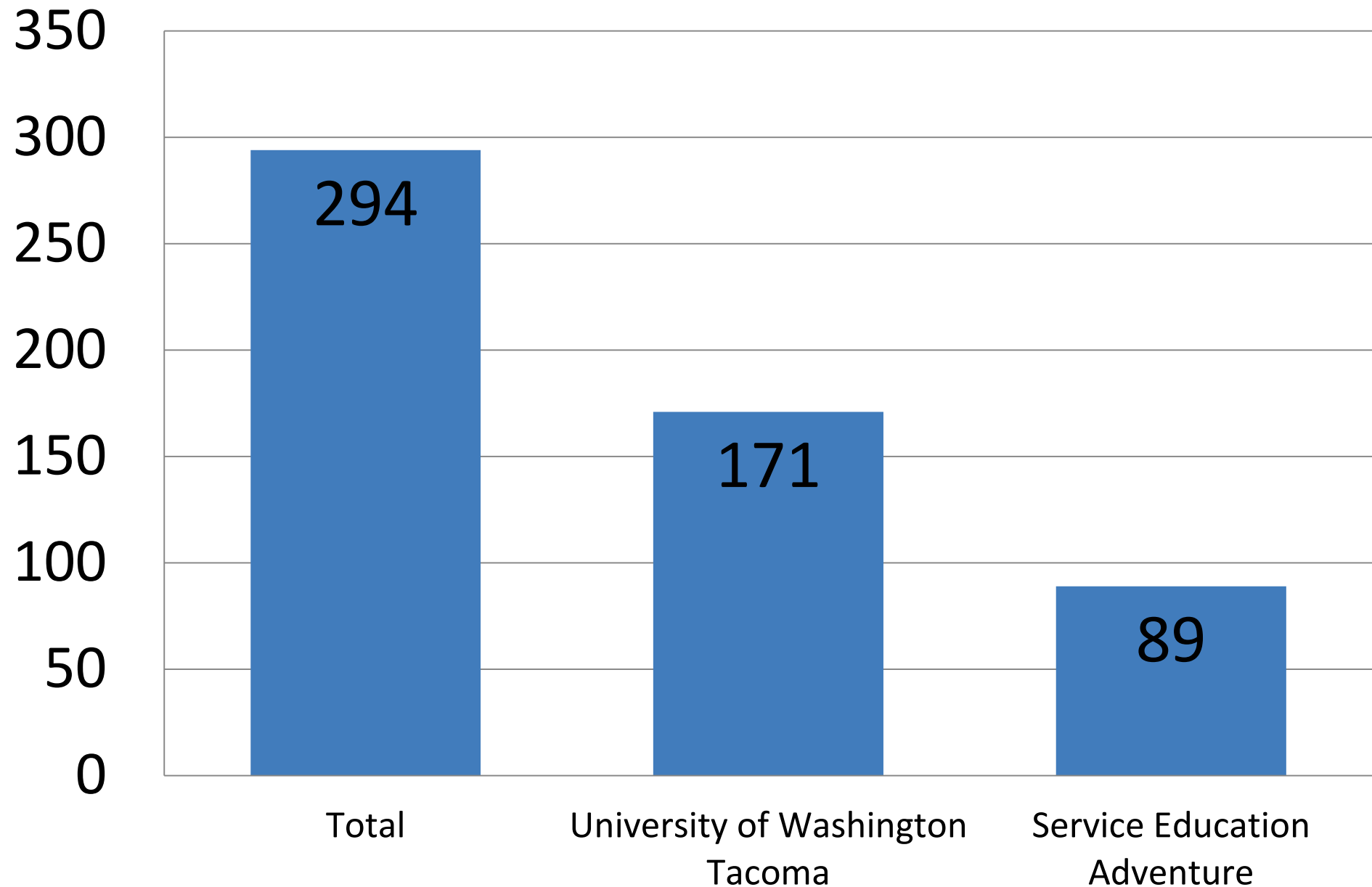


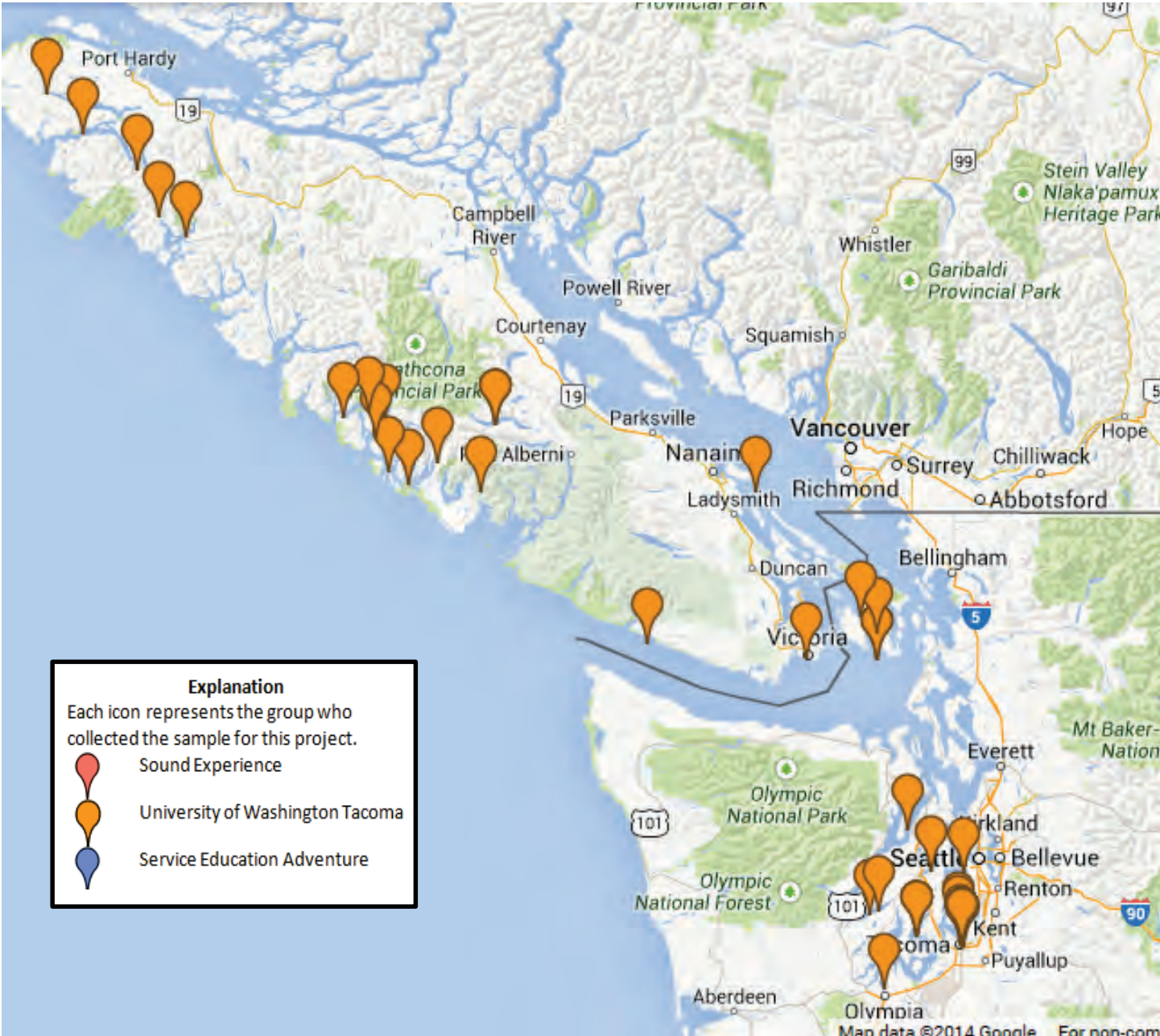


Explanation
Each icon represents the group who collected the sample for this project.

- Sound Experience
- University of Washington Tacoma
- Service Education Adventure




Number of Samples Collected

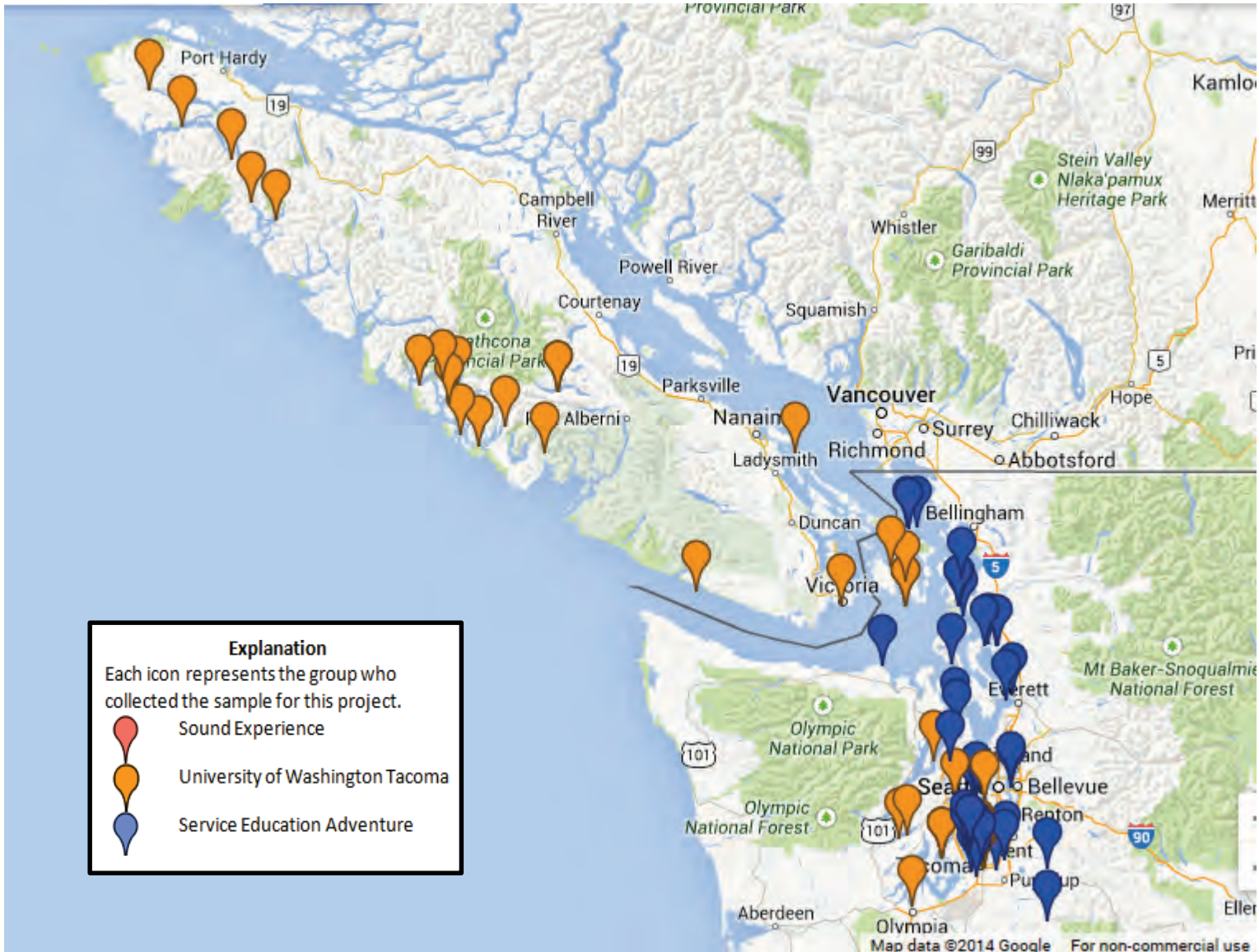




Explanation

Each icon represents the group who collected the sample for this project.

-  Sound Experience
-  University of Washington Tacoma
-  Service Education Adventure

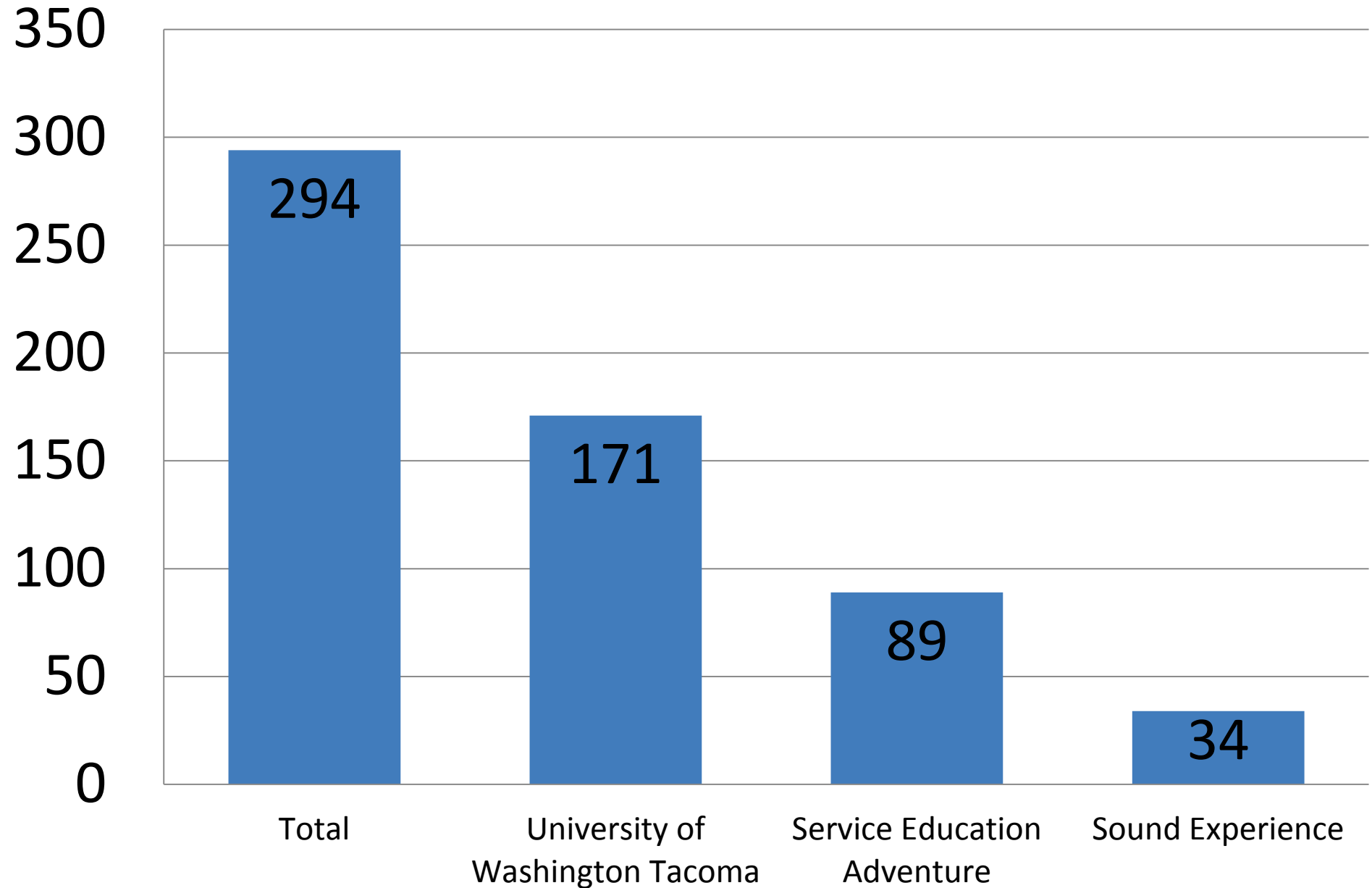


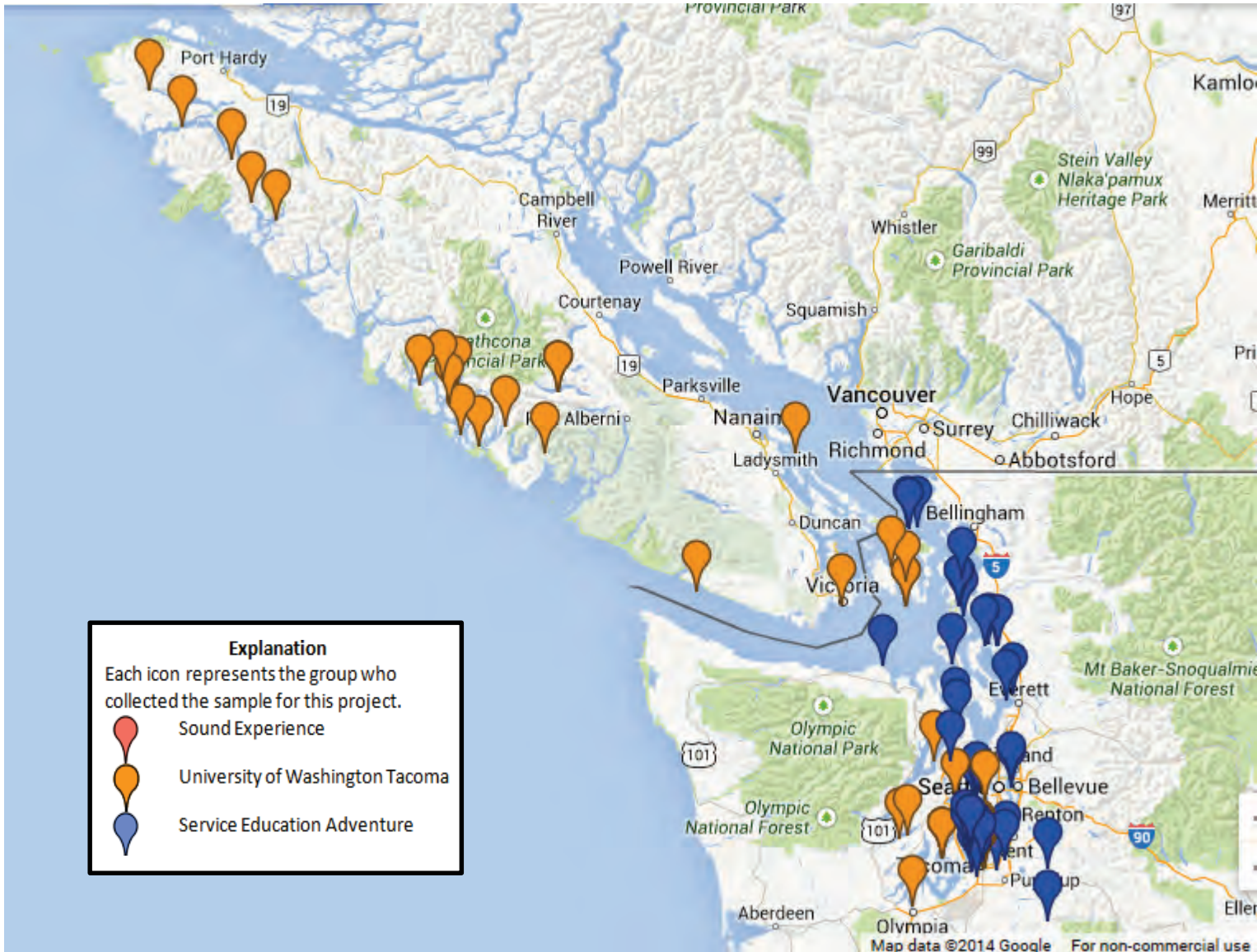
Explanation

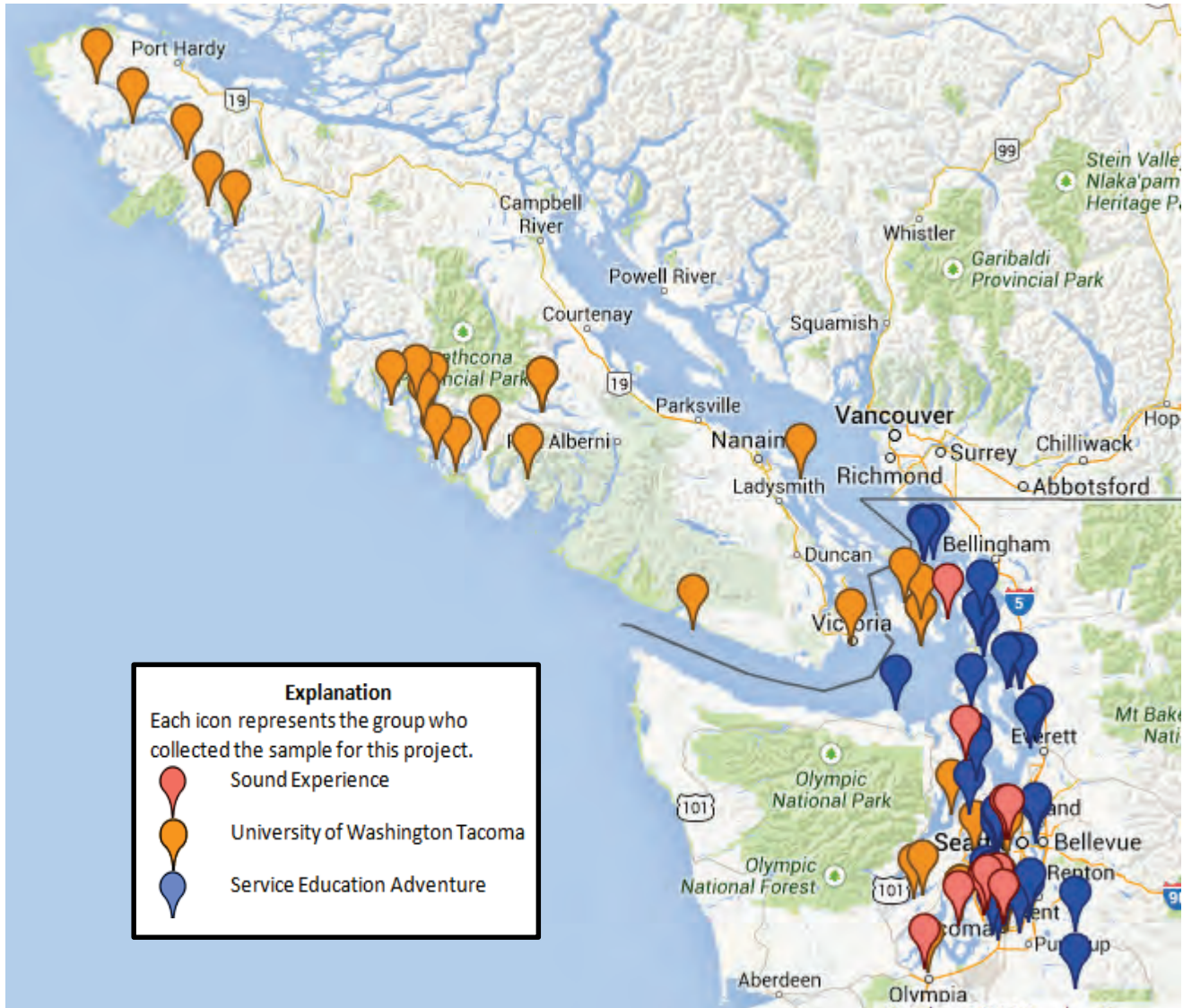
Each icon represents the group who collected the sample for this project.

- Sound Experience
- University of Washington Tacoma
- Service Education Adventure

Number of Samples Collected







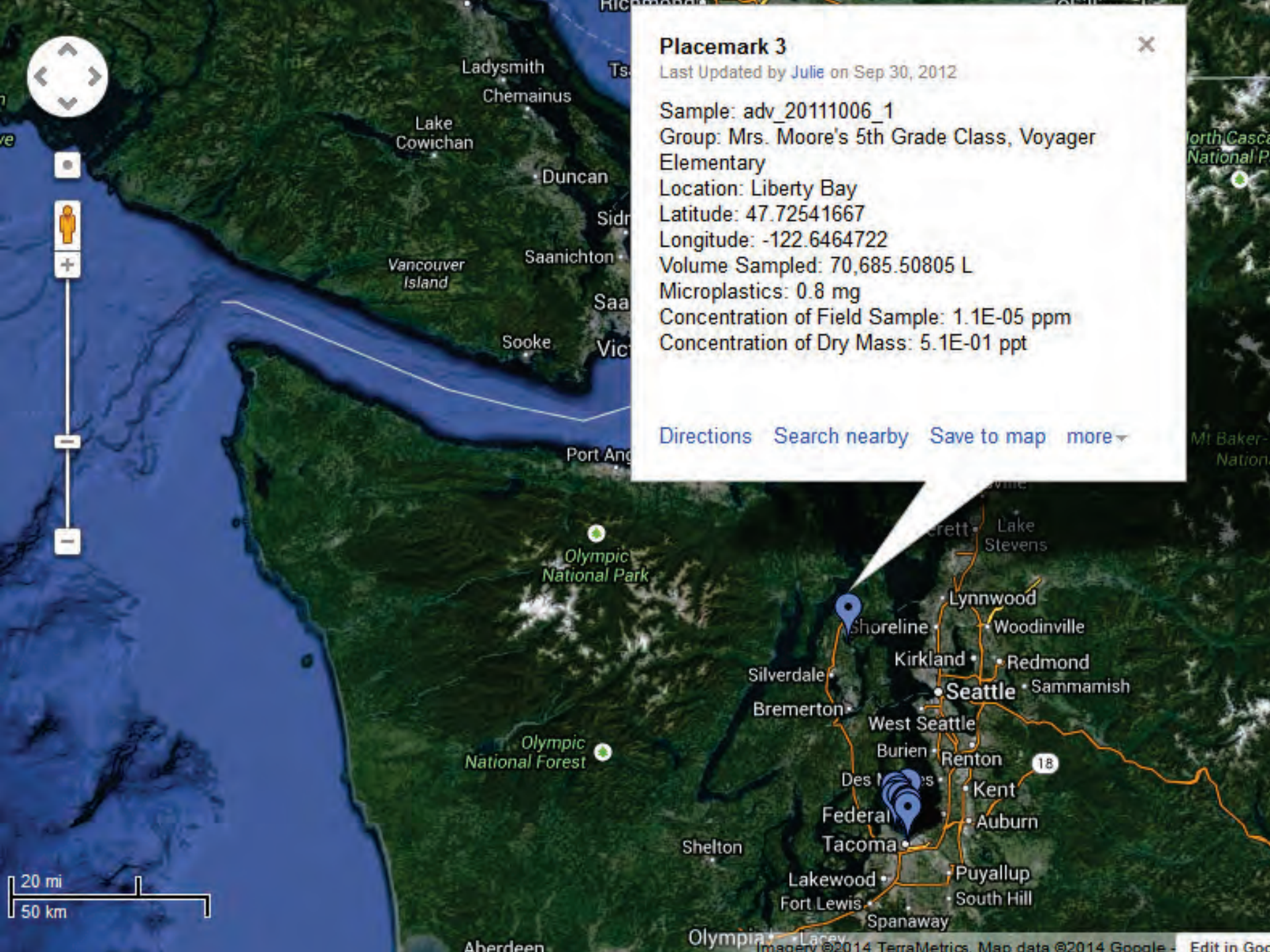
Outline

- Describe research project
- Review sampling and field methods
- Introduce partners
- Review contributions
- **Discuss benefits and challenges**

Benefits

- Increase sample numbers
- Exposure-educate public
- Experience
- Access to data





Placemark 3

Last Updated by Julie on Sep 30, 2012

Sample: adv_20111006_1

Group: Mrs. Moore's 5th Grade Class, Voyager Elementary

Location: Liberty Bay

Latitude: 47.72541667

Longitude: -122.6464722

Volume Sampled: 70,685.50805 L

Microplastics: 0.8 mg

Concentration of Field Sample: 1.1E-05 ppm

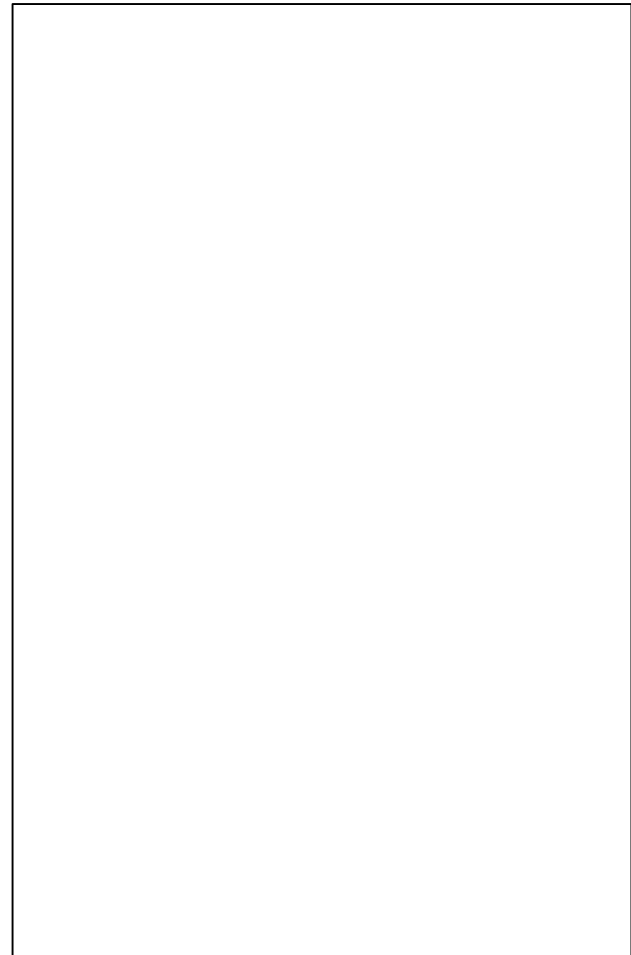
Concentration of Dry Mass: 5.1E-01 ppt

[Directions](#) [Search nearby](#) [Save to map](#) [more](#)

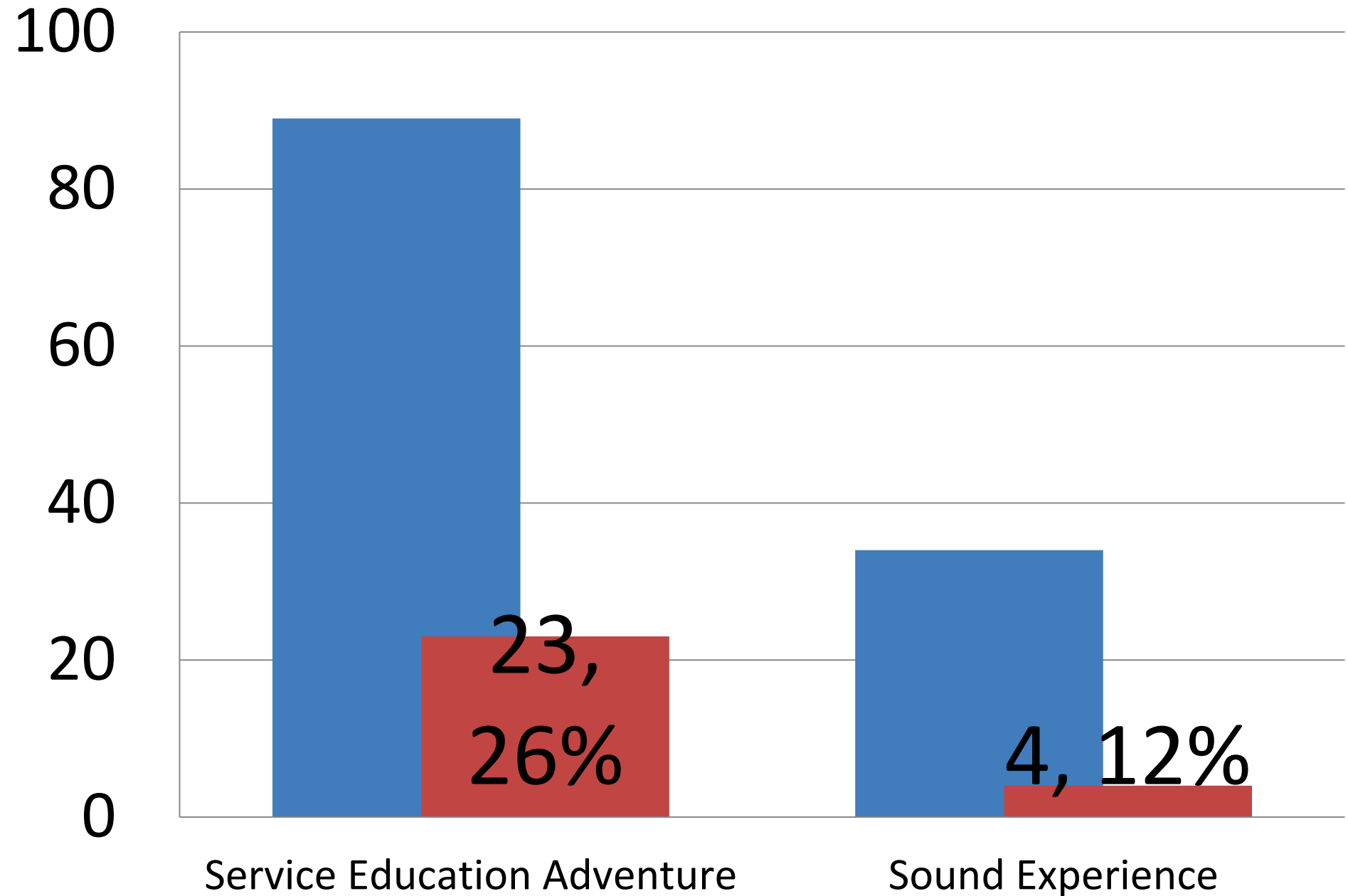
20 mi
50 km

Challenges

- Errors
 - Nontraditional scientists
 - Missing information
 - Lat, long, time, flow meter, etc.
 - Equipment maintenance
 - Labeling issues
 - Analyses
- Silver lining
 - Hands-on experience
 - Training tool for new students



Number of Samples Collected with Error



Recognition

- NOAA Marine Debris Program through the Joint Institutes for the Study of Atmosphere and Ocean



JISAO



To Learn More About Results

- CHARACTERIZING MICROPLASTICS OF SURFACE WATERS FROM THE PUGET SOUND, WASHINGTON
- **Lauren Reetz**, Julie E. Masura and Joel E. Baker
Center for Urban Waters,
University of Washington
Tacoma
- Poster Session TONIGHT
– 5-6 p.m.

